

Descriptions of New Genera from Brazil in the Tribes Heterospilini and Spathiini With Similar Wing Venation (Hymenoptera: Braconidae, Doryctinae)

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Abstract.—Six new genera and 11 new species are described from Brazil. These new taxa all have wing venation similar to that found in the genus *Heterospilus*, with fore wing vein 2RS absent or weakly indicated. The new genera are placed in the tribes Heterospilini and Spathiini and a key to the New World genera of these tribes is given. The new taxa described are as follows: *Amazondoryctes* Barbalho and Penteado-Dias, n.gen., *A. bicolor* Barbalho and Penteado-Dias, n. sp., *A. ater* Barbalho and Penteado-Dias, n. sp.; *Canchim* Barbalho and Penteado-Dias, n.gen., *C. carinatus* Barbalho and Penteado-Dias, n. sp., *C. erugosus* Barbalho and Penteado-Dias, n. sp.; *Heterospathius* Barbalho and Penteado-Dias, n.gen., *H. belokobylskiji* Barbalho and Penteado-Dias, n. sp., *H. petiolatus* Barbalho and Penteado-Dias, n. sp., *H. silvaticus* Barbalho and Penteado-Dias, n. sp.; *Jataiella pilosa* Barbalho and Penteado-Dias, n.gen., n.sp.; *Leptodoryctes luizi* Barbalho and Penteado-Dias, n.gen., n.sp.; *Pioscelus austrinus* Marsh, n. sp.; *Spathiospilus brasiliensis* Marsh, n. gen., n. sp.

The subfamily Doryctinae is one of the most diverse groups in the Braconidae, especially in the Old and New World tropics. Recent studies by Marsh for the Neotropics (see for instance Marsh 1993) and Belokobyl'skij for the Old World tropics (see for instance Belokobyl'skij 1994a, b, 1995) have shown the incredible diversity at the generic level and have led to revised concepts of previously described genera.

The genus *Heterospilus* was described by Haliday in 1836 and characterized by the absence of fore wing vein 2RS, thus the first and second submarginal cells are more or less confluent. In some cases, vein 2RS may be sclerotized but only appears as an infuscate line with no distinct vein edges such as a true tubular vein (see Mason 1986 for definition of wing vein types in braconids). This character was unique

for the Braconidae and for many years *Heterospilus* was the only genus known with such wing venation. Several more genera that were subsequently described with this type of wing venation have been synonymized with *Heterospilus* (Shenefelt and Marsh 1976; Belokobyl'skij 1992). Muesebeck and Walkley (1951) proposed the genus *Pioscelus* for two species which differed from the typical *Heterospilus* in other morphological characters. Hedqvist (1963) described the genus *Labania* which had this same wing venation; he placed it in the subfamily Hormiinae but stated that it had more affinities to the Doryctinae. The genus *Heterospilus* is a very large genus with about 500 species in the New World, most of which are undescribed. Thus, most doryctines with the fore wing vein 2RS absent have been placed in this genus.

Recent studies of the Neotropical fauna of the Doryctinae have revealed several forms with this wing venation but which differ in many distinct characters from typical *Heterospilus*. Until recently, these would have all been placed near *Heterospilus* in the tribe Heterospilini. However, some of these are more closely related to the genus *Spathius* Nees with its petiolate metasoma. These genera are properly placed in the tribe Spathiini as defined by Belokobyl'skij (1992). The genus *Labania* is placed in its own tribe, Labaniini, and is more closely related to the tribe Ecphyliini.

The purpose of this paper is to provide descriptions of several new genera from Brazil in the tribes Heterospilini and Spathiini which have this characteristic wing venation. Keys to the New World genera are also provided. This is part of a long term program by the first author (SMB) to study the Doryctinae of Brazil.

MATERIALS AND METHODS

The subfamily Doryctinae can be identified using the keys provided by Wharton *et al.* 1997. The New World genera can be identified using the key provided by Marsh (1997) and a key to the tribes of Doryctinae is provided by Belokobyl'skij

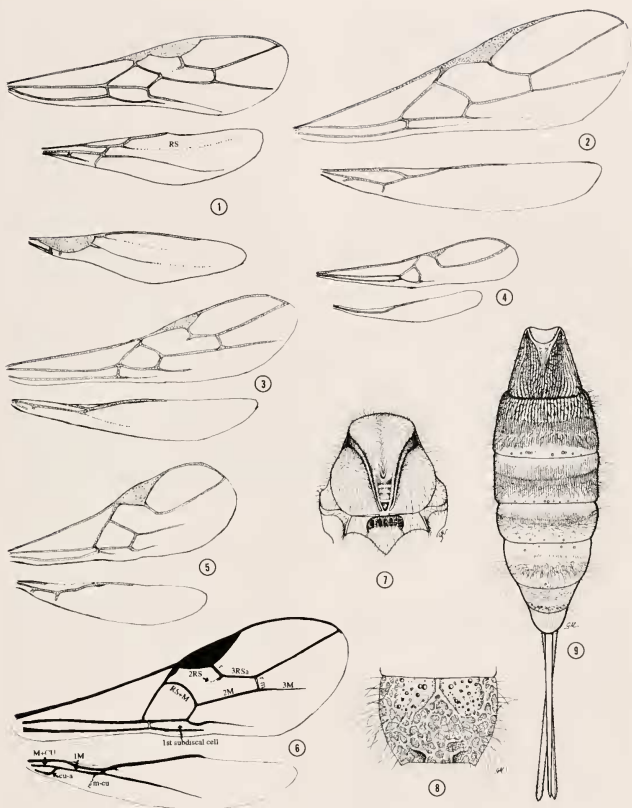
(1992). Morphological and wing venation characters are based on Wharton *et al.* (1997). Taxonomic authority for the new genera and species described here is as indicated for each taxon. Abbreviations for institutions that provided specimens for this study and where type specimens are deposited are: DCBU, Departamento de Ecologia e Biologia Evolutiva da Universidade Federal de São Carlos, São Carlos, SP, Brazil; INPA, Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil; UFPR, Universidade Federal do Paraná, Brazil; USNM, National Museum of Natural History, Smithsonian Institution, Washington, DC.

TRIBE HETEROSPILINI FISCHER

This tribe is distinguished from the Spathiini by the following characters: metasoma not petiolate, the first metasomal tergum being usually broad and short with length not much longer than apical width; the acrosternite of the first metasomal segment short, less than $\frac{1}{5}$ length of the tergum and not fusing with the lateral margins (Fig. 13); dorsope on first metasomal tergum usually distinct and deep (see Belokobyl'skij 1992).

KEY TO THE NEW WORLD GENERA OF THE TRIBE HETEROSPILINI

- | | | |
|-------|---|---|
| 1. | Fore wing vein r-m absent (Figs. 4, 5) | 2 |
| - | Fore wing vein r-m present (Figs. 1-3) | 3 |
| 2(1). | Hind wing veins cu-a and m-cu present (Fig. 5) | |
| | <i>Canchim</i> Barbalho and Pentead-Dias, new genus | |
| - | Hind wing veins cu-a and m-cu absent (Fig. 4) | |
| | <i>Leptodoryctes</i> Barbalho and Pentead-Dias, new genus | |
| 3(1). | Hind coxa with a more or less distinct antero-ventral basal tubercle or tooth | 4 |
| - | Hind coxa round at base, without antero-ventral basal tubercle or tooth | 5 |
| 4(3). | Body densely covered with long white hair (Figs. 7-9) | |
| | <i>Jataiella</i> Barbalho and Pentead-Dias, new genus | |
| - | Body usually sparsely covered with short hair | |
| | <i>Heterospilus</i> Haliday | |
| 5(3). | Second metasomal tergum with two posteriorly converging grooves (Fig. 15) | |
| | <i>Pioscelus</i> Muesebeck and Walkley | |
| - | First and second metasomal terga with two median parallel carinae (Fig. 29) | |
| | <i>Amazondoryctes</i> Barbalho and Pentead-Dias, new genus | |
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Figs. 1-9. Figs. 1-6, wings: 1, *Jataiella pilosa* n. sp.; 2, *Amazonodyctes ater* n. sp.; 3, *Heterospathius petiolatus* n. sp.; 4, *Leptodyctes luizi* n. sp.; 5, *Canchim carinatus* n. sp.; 6, *Spathiospilus brasiliensis* n. sp. Figs. 7-9, *J. pilosa*: 7, mesonotum; 8, propodeum; 9, metasoma.

***Amazondoryctes Barbalho and
Penteado-Dias, new genus***

Type species.—*Amazondoryctes bicolor* Barbalho and Penteado-Dias, new species.

Diagnosis.—Face striate; vertex, malar space and temples smooth and shining, frons smooth or slightly striate; propleuron with transverse carinae; pronotum weakly granulate with longitudinal scrobiculate groove; mesopleuron smooth; notauli distinctly scrobiculate; sternaulus complete; propodeum strongly areolate-rugose; hind coxa round at base, without basal tubercle; fore wing vein 2RS absent, first and second submarginal cells confluent, first subdiscal cell open at apex (Fig. 2); hind wing vein M+CU shorter than

1M; first, second and base of third metasomal terga striate, remaining terga slightly granulate, first and second terga with strong complete parallel carinae (Fig. 29).

Distribution.—Amazonas State of Brazil. One of us (PMM) has also seen an apparently undescribed species from Costa Rica.

Comments.—This genus is similar to *Pioscelus* and will run to that genus in the key provided by Marsh (1997) but is distinguished by the parallel, rather than diverging, carinae on the second metasomal carina.

Etymology.—The generic name is in reference to the locality of the two known species from Amazonia.

KEY TO SPECIES OF THE GENUS *AMAZONDORYCTES*

1. First and second metasomal terga striate, remaining terga smooth and shining; frons slightly excavated *A. bicolor* Barbalho and Penteado-Dias, new species
 – First, second and basal half of third metasomal terga striate; frons not excavated
 *A. ater* Barbalho and Penteado-Dias, new species

***Amazondoryctes bicolor* Barbalho and
Penteado-Dias, new species
(Fig. 30)**

Female holotype.—Head: circular; 28 antennomeres, first flagellomere shorter than scape plus pedicel; occipital carina meeting hypostomal carina; oral cavity small, diameter equal to malar space and $\frac{1}{3}$ eye height; face striate, 1.2 times longer than eye height; vertex, frons, malar space and temples smooth and shining; frons slightly excavated. Mesosoma (Fig. 30): propleuron with transverse carinae; pronotum weakly granulate, with longitudinal scrobiculate groove; mesopleuron smooth; mesonotum angled and declivous anteriorly; notauli scrobiculate and meeting before scutellum in costate-rugose area; middle mesonotal lobe granulate basally, alveolate apically, lateral lobes granulate; sternaulus complete, weakly scrobiculate;

metapleuron areolate; propodeum areolate with two longitudinal carinae laterally. Legs: fore tibia with single row of 8 spines on anterior edge; hind coxa without basal tubercle. Wings (as in Fig. 2): fore wing vein 2RS absent, first subdiscal cell open at apex, vein 2cu-a absent or represented by a fuscous spot; hind wing vein M+CU shorter than 1M, 1r-m more than half length of 1M, m-cu weak or absent. Metasoma: first and second terga striate, remaining terga weakly granulate; parallel median carinae on first and second terga complete and strong; ovipositor shorter than metasoma. Color: body and antenna dark brown, face yellowish, vertex dark brown, first metasomal tergum black, remaining terga brown, fore and middle legs yellow, hind coxa and femur brown, tibia yellow basally, brown apically, ovipositor sheaths yellow with black at apex,

wings slightly dusky. Body length: 3.1 mm.

Male.—Unknown.

Holotype female.—BRAZIL: Amazonas, Manaus, ZF3, Km 23, Fazenda Esteio Res. 1112, November 26, 1986, B. Klein col. Deposited in INPA.

Etymology.—The specific name is in reference to the bicolored body with the face yellow and mesosoma and metasoma dark brown or black.

***Amazondoryctes ater* Barbalho and
Penteado-Dias, new species**

(Figs. 2, 29)

Female holotype.—Agrees with the description of *A. bicolor* except as follows: 38 antennomeres; face with converging sculpture; frons not excavated, slightly striate and with rugose sculpture between toruli and eyes; eye height 2.4 times longer than diameter of oral cavity; first, second and basal half of third metasomal terga striate (Fig. 29); fore tibia with 3 rows of 22 strong spines; head and mesosoma entirely black, first and second metasomal terga black, remaining terga black on basal half, light brown on apical half; body length 4.6 mm.

Male.—Unknown.

Holotype female.—BRAZIL: Amazonas, Manaus, ZF3, Km23, Fazenda Esteio Res. 1208, February 9, 1985, B. Klein col. Deposited in INPA.

Paratypes.—BRAZIL: 1 female, Amazonas, Manaus, ZF3, Fazenda Esteio Res. 1112, February 9, 1985. Deposited in DCBU.

Etymology.—The specific name is in reference to the black color.

***Canchim* Barbalho and Penteado-Dias,
new genus**

Type species.—*Canchim carinatus* Barbalho and Penteado-Dias, new species.

Diagnosis.—Vertex and frons striate or smooth; face only slightly striate; temple and malar space smooth; mesonotum declivous anteriorly; notauli and sternaulus complete and scrobiculate; propodeum areolate-rugose; hind coxa rugose and with basal tubercle; fore tibia with row of 8 spines on anterior edge; fore wing veins r-m and 2RS both absent; hind wing vein M+CU slightly longer than 1M; first and at least basal half of second metasomal terga striate, terga beyond third smooth and shining.

Distribution.—São Paulo State of Brazil.

Comments.—This genus will run to *Heterospilus* in the key provided by Marsh (1997) but is distinguished by the absence of fore wing vein r-m, thus all submarginal cells are confluent.

Etymology.—The generic name is in reference to the localities for the known species, Fazenda Canchim, São Carlos, SP, Brazil.

KEY TO SPECIES OF THE GENUS *CANCHIM*

1. First, second and basal ½ of third metasomal terga striate; vertex and frons striate
 *C. carinatus* Barbalho and Penteado-Dias, new species
 – First and basal ½ of second metasomal terga striate; vertex and frons often smooth
 *C. erugosus* Barbalho and Penteado-Dias, new species
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***Canchim carinatus* Barbalho and
Penteado-Dias, new species**

(Figs. 5, 26–28)

Female.—Head (Fig. 28): occipital present and meeting hypostomal carina; ver-

tex and frons striate; face slightly striate; temple and malar space smooth; face height 1.4 times longer than eye height; eye width 2.2 times temple width; oral cavity about equal to malar space; 17 an-

tennomeres; first flagellomere equal to length of scape and pedicel. Mesosoma (Fig. 26): pronotum, mesopleuron and mesonotum granulate; mesonotum declivous anteriorly; notauli complete and scrobiculate; sternaulus scrobiculate, not complete; propodeum areolate-rugose. Legs: hind coxa rugose, with basal tubercle; fore tibia with row of 8 short spines on anterior edge. Wings (Fig. 5): fore wing veins r-m and 2RS both absent, first subdiscal cell open at apex, vein 2cu-a absent; hind wing vein M+CU slightly shorter than 1M. Metasoma (Fig. 27): length of first metasomal tergum equal to apical width; first, second and basal third of third terga striate, remaining terga smooth and shining; ovipositor $\frac{1}{4}$ length of metasoma. Color: head light brown; mesosoma and metasoma dark brown; second tergum sometimes with triangular yellow spot at base; legs yellow; wings hyaline, veins brown. Body length 2 mm.

Male.—Unknown.

Holotype female.—BRAZIL: Fazenda Canchim, São Carlos, São Paulo State, October 9, 1996. Deposited in DCBU.

Paratypes.—BRAZIL: 2 females, same data as holotype except dates of June 27, 1985 and July 26, 1989. Deposited in DCBU.

Etymology.—The specific name is in reference to the sculpture of the head.

***Canchim erugosus* Barbalho and
Penteado-Dias, new species**
(Fig. 25)

Female.—Agrees with the description of *C. carinatus* except as follows: head smooth and shining, vertex slightly striate (Fig. 25); mesopleuron slightly granulate; first and basal $\frac{2}{3}$ of second metasomal terga striate; ovipositor about $\frac{1}{3}$ length of metasoma; body length 1.8 mm.

Male.—Unknown.

Holotype female.—BRAZIL: Fazenda Canchim, São Carlos, São Paulo State, April 25, 1985, A. S. Soares col. Deposited in DCBU.

Paratypes.—BRAZIL: 1 female, Telêmaco Borba, PR, September 1, 1986, PROFAUPAR (Levantamento da Fauna Entomológica do Estado do Paraná). Deposited in UFPR.

Etymology.—The specific name is in reference to the smooth head.

***Jataiella* Barbalho and Penteado-Dias,
new genus**

Type species.—*Jataiella pilosa* Barbalho and Penteado-Dias, new species.

Diagnosis.—Body densely covered with long white hair; face, temples and vertex smooth and shining; frons striate; pronotum striate laterally; propleuron and mesopleuron smooth; notauli deep, smooth and meeting in a triangular area sculptured (Fig. 7); sternaulus absent; hind coxa with a small rounded tubercle at base; fore wing vein 2RS absent except for short stub, first subdiscal cell open (Fig. 1); hind wing vein M+CU shorter than 1M, male with stigma in hind wing; first metasomal tergum (Fig. 9) slightly longer than apical width; metasomal terga 1–3 and base of 4 striate, remaining terga striate at base, granular at apex.

Distribution.—São Paulo State of Brazil.

Comments.—This genus is distinguished from other genera of Heterospilini by the very densely hairy body, which will separate it from *Heterospilus* in the key provided by Marsh (1997).

Etymology.—The generic name is in reference to the locality of the type species.

***Jataiella pilosa* Barbalho and
Penteado-Dias, new species**
(Figs. 1, 7–9)

Female holotype.—Head: densely hairy; occipital carina present and meeting hypostomal carina; face and vertex smooth and shining, frons striate; face height 1.7 times eye height; eye width 1.8 times temple width; malar space $\frac{1}{3}$ oral cavity; first flagellomere equal to length of scape and pedicel combined. Mesosoma: densely hairy; pronotum striate laterally; propleu-

ron and mesopleuron smooth and shining; middle mesonotal lobe more elevated than lateral lobes, middle lobe with complete median longitudinal groove (Fig. 7); notauli deep, smooth, meeting before scutellum in area with longitudinal carinae and few cross carinae (Fig. 7); sternaulus absent; propodeum rugose-areolate with two basal smooth areas (Fig. 8). Legs: hind coxa with small tubercle at base; fore tibia with row of 9 spines on anterior edge. Wings (Fig. 1): fore wing vein 2RS absent except for short stub, vein r-m present, first subdiscal cell open at apex; hind wing vein M+CU shorter than 1M, r-m less than half length of 1M. Metasoma (Fig. 9): first metasomal tergum 1.2 times longer than apical width; terga 1–3 and base of 4 striate, remaining terga striate at base, granular at apex; ovipositor about $\frac{2}{3}$ length of metasoma. Color: body black, mesopleuron dark brown; wings infuscated. Body length: 5.6 mm.

Male.—Essentially as in female except as follows: propodeum smooth; all metasomal terga except apical one striate; stigma in hind wing (Fig. 1); only lower part of mesopleuron dark brown.

Holotype female.—BRAZIL: Rio Mogi-Guaçu, Luiz Antônio, São Paulo, November 26, 1993, L. A. Joaquim col. Deposited in DCBU.

Paratypes.—BRAZIL: 1 male, same data as holotype. Deposited in DCBU.

Leptodoryctes Barbalho and Penteado-Dias, new genus

Type species.—*Leptodoryctes luizi* Barbalho and Penteado-Dias, new species.

Diagnosis.—Head, pronotum, propleuron, mesopleuron and mesonotum smooth and shining; notauli meeting well before scutellum, sometimes incomplete; sternaulus complete and scrobiculate; propodeum rugulose; hind coxa round at base; fore wing veins 2RS, r-m, 2M and 3M absent, vein 2-1A also absent and, thus, first subdiscal cell absent; hind wing veins cu-a and m-cu absent; first metasomal tergum

weakly striate, remaining terga smooth and shining.

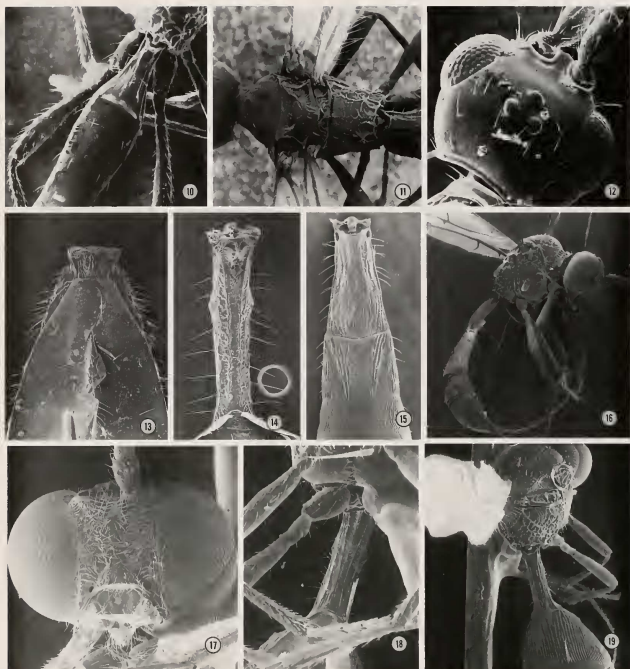
Distribution.—São Paulo, Amazonas and Rio de Janeiro States of Brazil.

Comments.—This genus is distinguished from most other braconids by the wing venation with the absence of several veins in both fore and hind wings. It can be definitely placed in the Doryctinae by the presence of a row of stout spines along the anterior edge of the fore tibia, presence of a flange at the apico-lateral corner of the propleuron, circular opening between clypeus and mandibles and presence of the occipital carina. The genus will not fit well in the key to genera provided by Marsh (1997) but would possibly run to *Heterospilus* because of the absence of fore wing vein 2RS.

Etymology.—The generic name is from the Greek *leptos*, meaning slender, weak, in reference to the fragile appearance of this genus.

Leptodoryctes luizi Barbalho and Penteado-Dias, new species (Figs. 4, 10–12, 31)

Female holotype.—Head (Fig. 12): completely smooth and shining; occipital carina present and meeting hypostomal carina; face height 2.3 times eye height; eye width equal to temple width; oral cavity diameter 1.2 times malar space. Mesosoma (Fig. 11): pronotum, propleuron, mesopleuron and mesonotum smooth and shining; notauli not complete, meeting well before scutellum; sternaulus complete and scrobiculate; propodeum rugose. Legs: hind coxa round at base; fore tibia with row of 8 spines on anterior edge. Wings (Fig. 4): fore wing veins 2RS, r-m, 2M and 3M absent, first subdiscal cell absent, vein 2-1A absent; hind wing veins cu-a and m-cu absent. Metasoma (Fig. 10): First metasomal tergum 3.2 times longer than apical width, weakly striate; remaining terga smooth and shining; ovipositor as long as entire body. Color: head, mesosoma, legs and first metasomal terga



Figs. 10–19. Figs. 10–12, *Leptodoryctes luizi*: 10, metasoma; 11, mesosoma; 12, head. Fig. 13, *Heterospilus* sp., ventral view, first metasomal segment. Fig. 14, *Notiospathius* sp., ventral view, first metasomal segment. Fig. 15, *Pioscelus austrinus* n. sp., metasoma, dorsal view. Figs. 16–19, *Spathiopilus brasiliensis*: 16, habitus; 17, face; 18, first metasomal segment, ventral view; 19, mesosoma and metasoma, dorsal view.

yellow, remaining terga and hind femur light brown; wings lightly infuscated. Body length: 1.6 mm.

Male.—Essentially as in female except as follows: head and mesosoma dark brown, metasoma light brown, legs yellow; fore wing vein 1A weak.

Holotype female.—BRAZIL: Amazonas,

Manaus, Reserva Ducke, September 6, 1993, M. T. Tavares, col. Deposited in DCBU.

Paratypes.—BRAZIL: 2 males, Ilha Grande, Rio de Janeiro, RJ, May 6, 1997, L. A. Joaquim, col.; 1 male, Estação Experimental de Ubatuba, SP, November 15, 1990, L. A. Joaquim, col. Deposited in DCBU.

Etymology.—This species is named after the collector and our friend Luiz Joaquim.

Pioscelus Muesebeck and Walkley

Pioscelus Muesebeck and Walkley, 1951: 180.

Pioscelus austrinus Marsh, new species
(Fig. 15)

Female.—Body color: head honey yellow; scape, pedicel and basal 3–6 flagellomeres honey yellow, remainder of flagellomeres brown; mesonotum brown, mesonotum and mesopleuron often light brown; fore and middle legs yellow, hind coxa except at apex and hind femur brown, apex of hind coxa, trochanters, tibia and tarsus yellow; metasoma brown, grooves on second metasomal tergum sometimes lighter; wings hyaline, veins including stigma light brown. Body size: 4.0 mm. Head: antenna with at least 19 antennomeres (broken in all females of type series), all flagellomeres at least 5 times longer than wide, first flagellomere very slightly shorter than second; vertex and temple smooth and shining; frons excavated, mostly smooth and shining but with a few striations medially; face rugulose and dull; eyes large, malar space about $\frac{1}{2}$ eye height; ocelli small, ocell-ocular distance about twice diameter of lateral ocellus; occipital carina complete, reaching hypostomal carina. Mesosoma: pronotum coriaceous with median scrobiculate groove; mesonotum coriaceous, median lobe sharply declivous anteriorly with lateral corners broadly produced, notauli scrobiculate, meeting before scutellum in narrow longitudinally rugose-carinate area; mesopleuron smooth medially, subalar area broadly scrobiculate, sternaulus smooth, as long as mesopleuron; propodeum slightly longer than first metasomal tergum, not declivous apically, rugose-areolate laterally, rugose dorsally with basal lateral areas indistinct, coriaceous. Wings: fore wing vein 2RS weak or absent, at most indicated by weak infus-

cated line apically, vein 3RSa twice as long as vein r, first subdiscal cell open at apex, vein 2cu-a absent; hind wing vein cu-a present, vein M+CU about $\frac{1}{2}$ length of 1M. Legs: hind coxa angled at base but without a distinct antero-ventral basal tubercle; hind femur short and swollen, about three times longer than width. Metasoma (Fig. 15): first tergum with length about twice as long as apical width, strongly longitudinally carinate; second tergum with two converging grooves enclosing a basal semicircular carinate area, tergum carinate laterally; third tergum separated from second by transverse arcuate groove, carinate on basal $\frac{3}{4}$, coriaceous apically; remainder of terga coriaceous basally, smooth apically; ovipositor about $\frac{1}{2}$ length of metasoma.

Male.—Essentially as in female; hind femur more greatly swollen, about twice as long as wide; hind wing without stigma.

Holotype female.—BRAZIL: Manaus, ZF3, Km23, Faz. Esteio, Res., 1208, B. Klein col., November 5, 1985. Deposited in INPA.

Paratypes.—BRAZIL: 2 females, same data as holotype, February 27, 1985, November 18, 1987; 1 female, Cerrado, Canchim, São Carlos, S.P., December 4, 1989, L. A. Joaquim, col.; 1 male, Mata Canchim, São Carlos, S.P., April 26, 1996, L. A. Joaquim, col. Deposited in DCBU.

Etymology.—The specific name is from the Latin *austrinus* meaning southern in reference to this species being the first one recorded from South America.

TRIBE SPATHIINI FOERSTER

This tribe is distinguished from the Heterospilini by the following characters: metasoma petiolate, first tergum usually long and narrow, acrosternite very long, at least $\frac{1}{2}$ length but usually nearly as long as the tergum, fused with lateral margins (Figs. 14, 18); dorsope on first tergum weak or absent (see Belokobyl'skiy 1992).

KEY TO THE NEW WORLD GENERA OF THE TRIBE SPATHIINI

1. Fore wing vein 2RS absent or not sclerotized (Figs. 3, 6) 2
 – Fore wing vein 2RS present and sclerotized 3
- 2(1). Eyes large, malar space very short or absent (Fig. 17); fore wing vein RS+M arched (Fig. 6); hind coxa with small but distinct antero-ventral basal tubercle *Spathiospilus* Marsh, new genus
 – Eyes smaller, malar space at least $\frac{1}{3}$ eye height; fore wing vein RS+M not arched (Fig. 3); hind coxa without basal tubercle (Fig. 21) *Heterospathius* Barbalho and Penteado-Dias, new genus
- 3(1). Hind coxa round at base, without basal tubercle 4
 – Hind coxa with distinct basal tubercle or tooth at base 5
- 4(3). Hind wing vein m-cu curved toward wing apex, hind wing vein M+CU $\frac{3}{4}$ length of vein 1M *Psenobolus* Reinhard
 – Hind wing vein m-cu curved toward wing base, hind wing vein M+CU $\frac{1}{4}$ length of vein 1M *Notiospathius* Matthews and Marsh
- 5(3). First metasomal tergum without triangle area at base *Spathius* Nees
 – First metasomal tergum with distinct triangular area at base 6
- 6(5). Fore wing vein m-cu arising distad of 2RS *Ptesimogaster* Marsh
 – Fore wing vein m-cu arising basad or directly in line with 2RS *Trigonophasmus* Enderlein

***Heterospathius* Barbalho and
 Penteado-Dias, new genus**

Type species.—*Heterospathius petiolatus* Barbalho and Penteado-Dias, new species.

Diagnosis.—Diameter of oral cavity about equal to malar space; occipital carina meeting hypostomal carina; 25–35 antennomeres; mesonotum declivous anteriorly; notauli complete, scrobiculate; sternaulus complete, scrobiculate; propodeum horizontal for basal $\frac{3}{4}$, usually with two lateral longitudinal carinae; hind coxa without basal tubercle; fore wing vein 2RS absent, first subdiscal cell open at apex, vein 2cu-a absent, hind wing vein M+CU shorter than 1M, m-cu absent, r-m less than $\frac{1}{2}$ length of 1M, no stigma in hind wing of male; first metasomal segment

long and slender, length at least 4 time apical width.

Distribution.—Amazonas, Pará, Rondônia and São Paulo States of Brazil. Also, one of us (PMM) has seen several undescribed species from Costa Rica, so the distribution of this genus is probably over Central and South America.

Comments.—This genus is similar to *Notiospathius* but is distinguished by the absence of vein 2RS in the fore wing; it will run to *Heterospilus* in the key provided by Marsh (1997) but is separated by the shape of the petiolate metasomal segment.

Etymology.—The generic name is in reference to the fore wing similarity to *Heterospilus* and the first metasomal segment similarity to *Notiospathius*.

KEY TO SPECIES OF THE GENUS *HETEROSPATHIUS*

1. Vertex and face strongly striate-rugose; ovipositor about 1.5 times longer than body (Fig. 24) *H. belokobylskiji* Barbalho and Penteado-Dias, new species
 – Vertex (Fig. 22) and face finely to weakly striate; ovipositor equal to or shorter than body 2
- 2(1). Ovipositor about $\frac{1}{2}$ length of metasoma *H. petiolatus* Barbalho and Penteado-Dias, new species

- Ovipositor about equal to body length
 *H. silvaticus* Barbalho and Pentead-Dias, new species

***Heterospathius petiolatus* Barbalho and
 Pentead-Dias, new species**

(Figs. 3, 20–23)

Female holotype.—Head (Fig. 22): occipital carina meeting hypostomal carina; face and vertex striate; frons smooth; temple smooth and shining; face height 2.1 times eye height; face width 1.6–2.1 times eye width; diameter oral cavity about $\frac{1}{2}$ eye height; eye width 1.4–1.7 times temple width; malar space about equal to diameter of oral cavity; 25 antennomeres, first flagellomere longer than scape and pedicel combined. Mesosoma (Fig. 20): pronotum rugulose-granulate; mesonotum declivous anteriorly; mesonotum rugulose-granulate; notauli scrobiculate, meeting at scutellum in triangular rugose area; mesopleuron granulate; sternaulus complete, scrobiculate; propodeum areolate-rugose, with distinct longitudinal carinae. Legs: fore tibia with single row of 7 spines on anterior edge; hind coxa (Fig. 21) rugose, without basal tubercle; first tarsomere of hind tarsus 2.3 times longer than second, second equal to length of third and fourth combined, fifth twice as long as fourth. Wings (Fig. 3): fore wing vein 2RS absent or represented by short stub, first subdiscal cell open at apex, vein 2cu-a absent; hind wing vein M+CU much shorter than 1M, r-m less than half length of 1M. Metasoma (Fig. 23): first tergum rugose, slender, length 5.7 times apical width, apical width equal to basal width; remaining terga smooth and shining; ovipositor about $\frac{1}{2}$ length of metasoma. Color: head, mesosoma and first metasomal tergum dark yellow, remaining terga dark to light yellow; ovipositor light yellow with apex black; apical 6–12 flagellomeres white, remainder brown; wings slightly dusky, veins brown, stigma brown with white at basal third. Body length: 3.3 mm.

Variation in female.—Face occasionally weakly striate or granular, width 1.6–2.1 times eye width; eye width 1.4–1.7 times temple width; 20–32 antennomeres; fore tibia with row of 7–13 spines; metasoma with apical terga occasionally black; body length 1.5–3.7 mm.

Male.—Essentially as in female except as follows: 20–25 antennomeres, apical 2–6 flagellomeres white; diameter of oral cavity slightly greater than malar space; face width 1.5–1.9 times eye width; frons smooth or granulate; fore tibia with row of 7–13 spines; metasoma completely light yellow or with apical $\frac{1}{4}$ dark brown; no stigma in hind wing.

Holotype female.—BRAZIL: Amazonas, Manaus, ZF3, Fazenda Esteio, November, 1984. Deposited in INPA.

Paratypes.—BRAZIL: 2 females, 1 male, Rondônia, Ariquemes, Rio Ji, October 28, 1986, R. A. Rafael, col; 1 female, Fazenda Canchim, São Carlos, São Paulo state, April 30, 1987, L. A. Joaquim, col; 1 female, Rio Tocantins, Tucuruí, Para state, November, 22, 1989, N. Degullier, col.; 1 female, Santarém-Cucurunã, Para state, February, 1996, A. R. Lisboa col.; 2 females, Amazonas, Manaus, ZF3, Faz. Esteio, Res. 1301, January 22, 1986; January 29, 1986, B. Klein col.; 1 female, 1 male Amazonas, Manaus, ZF3, Faz. Esteio, Res. 1208, October 22, 1986, B. Klein col.; 1 female, Amazonas, Manaus, km 60, PDBFF/WWF, Res. 1210, November 8, 1984, B. Klein col.; 1 female, Rio Tocantins, Tucuruí, Para state; 2 females, Rio Branco, Acre state, October 25–November 8, 1991, F. Ramos, A. Henriques, I. Gorayeb & N. Bitencourt cols.; 1 male, Amazonas, Manaus, ZF3, Faz. Esteio, Res. 1113, January 30, 1986, B. Klein col.; 1 male, Manaus, ZF3, Faz. Esteio, Res. 1113, January 23, 1986, B. Klein col.; 2 males, Manaus, ZF3, Faz. Es-



Figs. 20–31. Fig. 20–23, *Heterospathius petiolatus* n. sp.: 20, propodeum; 21, hind coxae; 22, vertex of head; 23, metasoma. Fig. 24, *Heterospathius belokobylskiji* n. sp., metasoma. Fig. 25, *Canchim erugosus* n. sp., vertex of head. Figs. 26–28, *C. carinatus* n. sp.: 26, mesopleuron; 27, metasoma; 28, vertex of head. Fig. 29, *Amazonodoryctes ater* n. sp., metasoma. Fig. 30, *A. bicolor* n. sp., mesopleuron. Fig. 31, *Leptodoryctes luizi*, habitus.

teio, Res. 1208, November 20, 1984; October 17, 1984, B. Klein col.; Conceição do Araguaia, Para state, January 19–31, 1983, R. Nonato col. Deposited in DCBU, INPA, USNM.

Etymology.—The specific name is in reference to the petiolate metasoma.

***Heterospathius belokobylskiji* Barbalho
and Pentead-Dias, new species**
(Fig. 24)

Female.—Agrees with the description of *petiolatus* except as follows: 35–38 antennomeres, apical 12–13 flagellomeres white; face and vertex strongly striate-rugose, vertex occasionally strongly striate; frons striate; temples smooth; face height 1.6 times eye height; fore and mid granulate; propodeum without strong longitudinal carina; ovipositor 1.5 times longer than body (Fig. 24); body entirely brown; body length 5.5 mm.

Male.—Unknown.

Holotype female.—BRAZIL: Amazonas, Manaus, ZF3, Km32, Fazenda Esteio, January, 1986, B. Klein col. Deposited in INPA.

Paratypes.—BRAZIL: 1 female, same data as holotype; 1 female, Pará, Santarém-Cucurunã, February, 1996, A. Pentead-Dias, col. Deposited in INPA, DCBU.

Etymology.—This species is named in honor of our colleague and fellow researcher on the Doryctinae, Sergey Belokobyl'skij, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

***Heterospathius silvaticus* Barbalho and
Pentead-Dias, new species**

Female holotype.—Agrees with description of *petiolatus* except as follows: 27 antennomeres, apical 8 flagellomeres white; face striate; vertex only slightly striate; frons, temple and malar space smooth and shining; face width 2.2 times eye width; face height 1.7 times eye height; diameter of oral cavity slightly greater than malar space; no longitudinal carinae on propo-

deum; fore tibia with row of 7 spines on anterior edge; fore and middle coxa weakly striate; ovipositor about equal to body length; body length 2.8 mm.

Male.—Agrees with female except as follows: entire body light brown, propodeum dark brown.

Holotype female.—BRAZIL: Amazonas, Manaus, ZF3, Km23, Fazenda Esteio, November 8, 1984, B. Klein col. Deposited in INPA.

Paratypes.—BRAZIL: 1 male, Amazonas, São Gabriel da Cachoeira, April 29, 1982, J. A. Arias, col. Deposited in DCBU.

Etymology.—The specific name is from the Latin *silvaticus* meaning belonging to woods or trees in reference to the collection of this species in the jungle.

***Spathiospilus* Marsh, new genus**

Type-species.—*Spathiospilus brasiliensis* Marsh, new species.

Diagnosis.—Cyclostome braconid, oral cavity circular, labrum concave; eyes large, malar space very small or absent; flagellomeres with double row of placodes separated by ridge around middle of flagellomere; mesonotum strongly declivous anteriorly; fore wing vein 2RS absent or weakly present apically near vein r, vein RS+M strongly arched, hind wing of male with stigma; for tibia with row of short stout spines along outer edge, hind coxa with small but distinct antero-ventral basal tubercle; metasoma petiolate, first tergum slender, parallel sided, rest of metasoma suddenly widened, acrosternum nearly as long as tergum and fused with tergum.

Distribution.—São Paulo State of Brazil. We have also seen one undescribed species from Panama.

Comments.—This genus is similar to *Heterospathius* in the Spathini by the absence of fore wing vein 2RS but distinguished by the strongly arched fore wing vein RS+M and the large eyes. In the key provided by Marsh (1997) it will run to *Heterospilus* but is distinguished by the long

and fused acrosternum of the first metasomal segment.

Etymology.—The generic name refers to the similarity to *Heterospilus* by the wing venation and to *Spathius* by the petiolate metasoma.

Spathiospilus brasiliensis Marsh,
new species
(Figs. 6, 16–19)

Female.—Body color: head, mesosoma and metasoma reddish-brown, metasomal terga 2–5 sometimes infused with black; scape and pedicel yellow, flagellum yellow basally turning brown to apex; legs yellow; wings hyaline, veins yellow at base and apex, stigma and veins across middle of wing brown; ovipositor sheaths yellow, black at tip. Body size: 3–4 mm. Head (Fig. 17): 29–31 antennomeres, flagellomeres with two rows of placodes separated by ridge around middle of each flagellomere; eyes large, covering most of head; malar space extremely short or absent, lower margin of eye nearly touching base of mandible; face narrow, width less than length from clypeus to antennal sockets; oral cavity circular, diameter slightly greater than basal width of mandible; temple very narrow, about $\frac{1}{5}$ eye width; ocellular distance shorter than diameter of lateral ocellus; face, frons and vertex rugulose-coriaceous, temple coriaceous; occipital carina scrobiculate along vertex and temple side. Mesosoma (Fig. 19): pronotum with scrobiculate groove across dorsal surface extending laterally on each side, bordered laterally by strong carina, dorsally coriaceous; mesonotum strongly declivous anteriorly, mesonotal lobes coriaceous, notauli scrobiculate, median lobe with short and wide carinate-rugulose area before scutellum and with median raised line extending to pronotum; scutellum coriaceous, bordered laterally by carina, scutellar sulcus deep with 5 cross carinae; mesopleuron coriaceous, subalar area rugose, sternaulus scrobiculate; propodeum strongly areolate-rugose apically

and laterally, with semicircular coriaceous areas basolaterally bordered by distinct carinae. Wings (Fig. 6): fore wing vein $r\frac{1}{2}$ length of 3RSa, vein RS+M strongly arched; hind wing vein RS absent, vein m-cu curved toward wing apex. Metasoma (Fig. 19): first tergum petiolate, parallel sided with apical and basal widths equal, longitudinally costate, weakly rugulose between costae; second tergum longitudinally costate, weakly rugulose between costae, triangular shaped with basal width about $\frac{1}{2}$ apical width, weak line between second and third tergum; third tergum longitudinally costate on basal $\frac{2}{3}$, coriaceous on apical $\frac{1}{3}$; remainder of terga coriaceous; ovipositor about $\frac{1}{3}$ length of metasoma.

Male.—Essentially as in female; 26 antennomeres; stigma present in hind wing.

Holotype Female.—BRAZIL: Rio Mogi Guaçu, Luís Antônio, S.P., February 18, 1988, L. A. Joaquim collector. Deposited in DCBU.

Paratypes.—BRAZIL: 1 female, 3 males, same data as holotype with additional dates of March 20–27, 1987; 1 female, Luís Antônio, S.P., Reserva Ecol. do Jataí, February 8, 1994, A. S. Soares collector; 1 female, Faz. Canchim, São Carlos, S.P., June 20, 1985, A. S. Soares collector. Deposited in USNM, DCBU.

Etymology.—The specific name is in reference to the localities of the types series from Brazil.

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